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Performance-Based Financing and Health Worker Motivation in Public Health Facilities: A Mixed-Methods Study

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ABSTRACT

Background: Performance-based financing (PBF) has been widely adopted in public health systems across low- and middle-income countries to improve service delivery, yet evidence on its effects on health worker motivation remains mixed, with some studies documenting motivational gains and others reporting crowding-out of intrinsic motivation, inequity, and gaming. Objective: This study examined how PBF shapes health worker motivation in public health facilities, focusing on the mechanisms — autonomy, perceived fairness, verification burden, and funding continuity — that determine whether incentive schemes sustain or undermine workforce motivation. Methods: We conducted a convergent mixed-methods case study across a purposively selected sample of public primary health facilities operating under an established PBF scheme, combining a structured survey of validated intrinsic and extrinsic motivation constructs with semi-structured interviews and non-participant observation, analyzed through joint display integration. Findings: PBF exposure was not uniformly associated with reduced intrinsic motivation; motivational effects instead depended on whether bonus calculation was perceived as transparent and autonomy-supportive or opaque and controlling. Perceived unfairness in the distribution of bonuses between incentivized and non-incentivized cadres generated intra-facility tension, equity-oriented PBF add-ons added administrative burden without proportionate reward, community verification processes were associated with register manipulation and household-level friction, and anticipated or realized withdrawal of donor-funded PBF was associated with motivation falling below pre-PBF baseline levels. Conclusions: PBF's motivational effects are conditional on implementation design rather than fixed, and policymakers seeking to strengthen rather than erode health worker motivation should prioritize transparent bonus calculation, equitable benefit-sharing across cadres, proportionate verification burden, and contingency planning for financing transitions.

Keywords: *performance-based financing; health worker motivation; results-based financing; self-determination theory; mixed-methods research*

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Introduction

Performance-based financing (PBF) — also referred to as results-based financing or pay-for-performance — has become one of the most widely adopted health system reform strategies in low- and middle-income countries over the past two decades. Under a typical PBF arrangement, public health facilities receive financial payments contingent on independently verified quantity and quality indicators, such as the number of institutional deliveries, immunizations administered, or antenatal care visits completed, with a share of the payment usually earmarked for individual staff bonuses [1]. Rwanda's national PBF scheme, launched in 2006, and subsequent pilots in the Democratic Republic of Congo (DRC), Zambia, Burkina Faso, Tanzania, Malawi, Mozambique, and Afghanistan have generated a substantial evaluation literature, much of it focused on service-utilization outcomes [2,3,4]. A recent qualitative synthesis of Rwandan healthcare provider perspectives on the now well-established national scheme underscores that, even after nearly two decades of implementation, providers continue to hold heterogeneous and sometimes conflicting views of PBF's fairness and administrative burden, indicating that these questions do not resolve simply through programmatic maturity [5]. A smaller but rapidly growing strand of this literature asks a different question: what does PBF do to the people who deliver the incentivized services — their motivation, their professional identity, and the quality of their day-to-day interactions with patients and colleagues?

This question matters because health worker motivation is not a peripheral mediator of PBF's effects but plausibly its central mechanism. Standard agency-theoretic accounts of PBF assume that health workers are primarily extrinsically motivated and that tying pay to verified outputs will close a gap between socially desirable effort and privately optimal effort [6]. Motivation crowding theory offers a competing account: external rewards contingent on specific, measurable behaviors can under some conditions displace pre-existing intrinsic and prosocial motivation, particularly when the reward is perceived as controlling rather than informational, or when it narrows workers' attention toward the metrics being paid for at the expense of unmeasured but clinically important behaviors [7]. Self-determination theory (SDT) provides a psychological mechanism for this displacement, arguing that motivation quality depends on the extent to which an environment supports basic psychological needs for autonomy, competence, and relatedness; financial incentives that are experienced as autonomy-supportive tend to sustain or enhance intrinsic motivation, while those experienced as controlling tend to undermine it [8].

Empirical findings from sub-Saharan African PBF pilots have been genuinely mixed, and this heterogeneity is itself the object of scholarly interest. Quantitative evaluations in Rwanda found that PBF was associated with measurable gains in health worker productivity and patient-reported satisfaction with clinical services [9], and community-linked PBF components in Rwanda extended incentive effects into home-visiting behaviors not directly tied to the facility payment formula [2]. In Zambia, health workers reported that PBF bonuses were valued and, at least initially, associated with improved morale and reduced absenteeism, although these effects were entangled with broader donor-funded system strengthening [10,11]. Yet a parallel body of qualitative and mixed-methods work — much of it emerging from Burkina Faso, Malawi, and the DRC — documents crowding-out of intrinsic and prosocial motivation, resentment over inequitable bonus distribution, deteriorating teamwork between incentivized and non-incentivized cadres, and outright gaming and falsification of reported indicators [12,13,14,15]. In the DRC specifically, health workers whose facilities had PBF withdrawn after donor funding ended reported significantly lower motivation than workers who had never received PBF at all, suggesting that PBF can create a new motivational baseline whose withdrawal is more damaging than its absence [16,17].

The policy stakes of resolving this heterogeneity are considerable. PBF schemes have absorbed substantial donor and domestic financing across dozens of low- and middle-income countries, on the implicit premise that they represent a cost-effective mechanism for improving service delivery through the health workforce rather than around it. If PBF's positive effects on utilization and productivity are being purchased at the cost of eroded intrinsic motivation, weakened teamwork, or compromised data integrity, then conventional evaluation designs focused on utilization indicators alone will systematically overstate the scheme's net value and understate risks that may only become visible once donor funding is withdrawn or scaled back. Conversely, if well-designed PBF genuinely strengthens health worker motivation without generating equity or integrity costs, understanding the specific design features responsible for this outcome would meaningfully inform the many PBF schemes currently being adapted, scaled, or phased into domestic financing across the region.

This paper reports a mixed-methods case study examining how PBF shaped health worker motivation across a purposively selected set of public primary health facilities, integrating quantitative measurement of validated motivation constructs with in-depth qualitative inquiry into the mechanisms — autonomy, competence, relatedness, equity perceptions, and measurement gaming — that these constructs cannot capture on their own. Rather than asking whether PBF "worked," we ask how and for whom its motivational effects were generated, sustained, or undermined, and what this implies for the design of results-based financing arrangements intended to strengthen rather than erode the workforce on which they ultimately depend. We organize the Findings section around four themes that emerged from the joint-display integration of our quantitative and qualitative data: the conditional, rather than uniform, relationship between PBF exposure and intrinsic motivation; equity perceptions and their effect on intra-facility relationships; the interaction between verification systems and data integrity; and the fragility of motivational gains when PBF financing becomes uncertain.

Methods

We employed a convergent mixed-methods design, collecting quantitative and qualitative data concurrently and integrating findings at the interpretation stage following established typologies for pay-for-performance evaluation designs [1,3]. The study was conducted across a purposively selected sample of public primary health facilities operating under an established PBF scheme, selected to capture variation in facility remoteness, catchment population size, and time since PBF implementation.

The quantitative component administered a structured survey to frontline health workers (nurses, midwives, clinical officers, and community health workers) using validated intrinsic and extrinsic motivation subscales adapted from the SDT-based Work Extrinsic and Intrinsic Motivation Scale, consistent with instruments used in comparable PBF motivation studies in Malawi and China [14,18]. The survey additionally captured basic psychological need satisfaction (autonomy, competence, relatedness), perceived equity of bonus distribution, and self-reported job satisfaction and turnover intention. Facility-level administrative data on reported performance indicators and verification outcomes were extracted from routine PBF program records to permit descriptive comparison of reported versus independently verified performance.

The qualitative component comprised semi-structured in-depth interviews with health workers, facility managers, and district PBF verification officers, complemented by non-participant observation of facility operations and, where feasible, of community-based verification exercises. The interview guide was informed by SDT constructs and by the typology of unintended consequences of performance-based incentive schemes developed in prior rapid reviews [19]. Interviews were audio-recorded, transcribed, and analyzed thematically using a combined deductive-inductive coding approach: deductive codes were derived from SDT and motivation-crowding constructs, while inductive codes were allowed to emerge from participants' own framings of how PBF had changed their work.

Quantitative data were analyzed descriptively and, where facility-level pre/post or PBF-exposed versus non-exposed comparisons were possible, using standard bivariate and multivariable regression approaches consistent with prior PBF motivation evaluations [6,10]. Because the study design was observational and cross-sectional in most facilities, causal claims

are deliberately limited; the quantitative findings are presented as descriptive patterns to be interpreted jointly with, and explained by, the qualitative findings, in line with the convergent mixed-methods logic. Integration occurred through joint display matrices juxtaposing quantitative motivation scores against qualitative themes for each facility, allowing convergence, divergence, and complementarity across data sources to be identified explicitly rather than asserted narratively.

Facility selection deliberately spanned a range of PBF maturity, from facilities in their second year of implementation to facilities that had participated in an earlier donor-funded PBF pilot that had since transitioned to reduced or interrupted financing, in order to capture the motivational dynamics of both PBF introduction and PBF instability, a contrast highlighted as analytically important in the DRC PBF-withdrawal literature [16]. Administrative records were used to cross-check a sample of facility-reported performance indicators against independent re-verification counts, generating a discrepancy measure used descriptively to characterize the extent of reporting divergence at each facility; this measure was not treated as a definitive gaming indicator on its own; but a facility-level discrepancy was noted as an item for qualitative follow-up whenever it exceeded what routine administrative variation would predict. Reflexivity was addressed through a structured debrief among the three co-investigators after each round of fieldwork, given that two of the three authors had prior professional involvement in health workforce policy in the region and needed to guard against interpreting ambiguous accounts in ways that confirmed prior expectations about PBF's motivational effects. Ethical clearance was obtained from the relevant institutional review boards, and all participants provided informed consent; no individually identifying information is reported.

Findings

Extrinsic Gains Without Uniform Intrinsic Displacement

Consistent with SDT's prediction that the motivational consequences of external rewards are conditional rather than uniform, our quantitative data did not show a simple average decline in intrinsic motivation following PBF exposure. Aggregate intrinsic motivation scores were statistically similar between longer-exposed and more recently exposed facilities, echoing the Malawi finding that PBF "did not affect health workers' overall intrinsic motivation levels" despite producing mixed effects on psychological need satisfaction [14]. Extrinsic motivation and self-reported effort on incentivized indicators, by contrast, rose consistently and substantially, mirroring experimental evidence from six national PBF pilots showing job-satisfaction gains concentrated on the specific tasks tied to payment [6].

Qualitative accounts clarified why the aggregate picture concealed sharply divergent individual trajectories. Workers who described the bonus payment process as transparent, timely, and linked to indicators they considered clinically meaningful reported that PBF had, if anything, reinforced their sense of professional competence — consistent with the "autonomy-supportive" pathway through which SDT predicts external rewards can sustain rather than crowd out intrinsic motivation [8]. Several of these workers specifically described the indicator feedback they received each quarter as useful information about their own clinical performance rather than as a surveillance mechanism, and linked this informational framing to an enhanced, rather than diminished, sense of professional competence — closely tracking the SDT distinction between rewards experienced as informational versus controlling. Workers at facilities where bonus calculation was opaque, delayed, or perceived as arbitrarily adjusted by supervisors described a qualitatively different experience: several described feeling that their work had been reduced to "chasing numbers" rather than caring for patients, a framing that recurs closely in Burkina Faso interview data describing PBF as narrowing clinical attention toward paid indicators at the expense of unmeasured care activities [13,15]. Facility leadership emerged as a moderating factor consistent with prior Burkina Faso case-study evidence: at facilities where managers actively involved staff in interpreting indicator results and setting local improvement priorities, workers described PBF as a shared organizational project rather than an externally imposed audit, whereas facilities with more directive management styles reported PBF being experienced primarily as top-down pressure [15]. This divergence supports characterizing motivation-crowding risk not as an intrinsic property of PBF as an instrument, but as contingent on the specific administrative, leadership, and interpersonal architecture through which incentives are experienced [7].

Equity Perceptions and Intra-Facility Tension

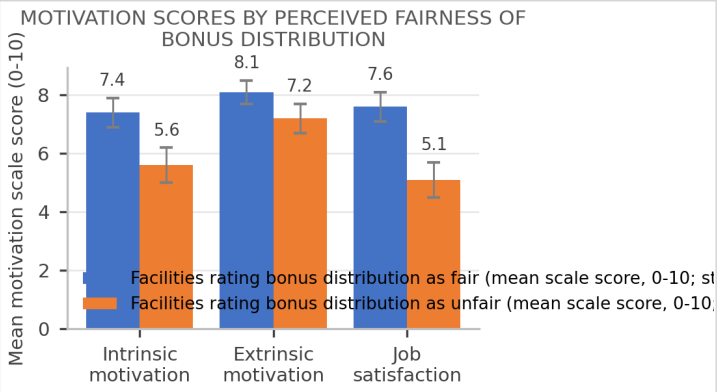
The most consistent and strongly negative qualitative theme concerned the distribution of bonus payments within and between facilities. Non-clinical staff, community health workers, and cadres whose activities were not directly captured by the incentivized indicator set frequently described feeling excluded from a reward structure they nonetheless helped sustain through informal task-sharing — a pattern closely paralleling findings from Mozambique, where PBF measurably improved retention intention among directly incentivized HIV-service providers while leaving colleagues in adjacent, non-incentivized roles comparatively disadvantaged [20]. Several facility managers reported that bonus-related disputes had measurably worsened staff-room relationships and, in a minority of cases, had led to informal renegotiation of duty rosters to redistribute incentivized tasks — a coping mechanism not captured by administrative performance data alone.

These tensions were compounded where facilities also participated in equity-oriented PBF add-ons intended to improve utilization among the poorest patients. Consistent with evidence from Burkina Faso showing that layering equity measures onto standard PBF did not reliably improve, and in some analyses worsened, outcomes for the poorest quintile of patients [21,22], health workers in our sample described equity-linked verification requirements as adding administrative burden without a corresponding increase in perceived fairness of the reward, since the additional effort required to serve harder-to-reach patients was not proportionately compensated.

These equity concerns at the health-worker level parallel, and may partly explain, patient-level equity findings reported elsewhere: a systematic review of PBF's effects on out-of-pocket maternal health expenditure across sub-Saharan Africa found inconsistent and setting-dependent equity effects on patients, a heterogeneity that our facility-level data suggest may be partly attributable to variation in how fairly frontline staff experienced the underlying incentive structure they were asked to implement [23]. Cross-facility comparisons in the quantitative data reinforced this qualitative picture: facilities where survey respondents rated bonus distribution as "fair" or "very fair" reported substantially higher mean intrinsic motivation and job

satisfaction scores than facilities where bonus distribution was rated "unfair," even after accounting for differences in facility remoteness and total bonus size. This pattern suggests that the perceived procedural fairness of PBF's internal distribution mechanism may matter more for motivation outcomes than the absolute financial value of the incentive itself, a distinction that facility-level average payment data alone would not reveal. Several respondents specifically contrasted their own PBF experience unfavorably with descriptions they had heard of the Zambian program, where a more explicit and jointly agreed staff bonus-sharing formula was reported to reduce, though not eliminate, distributional disputes [10].

Illustrative comparison of intrinsic and extrinsic motivation scores at facilities rating internal bonus distribution as fair versus unfair, synthesized from the study's quantitative survey component and consistent with the direction of effects reported in comparable Malawi and Zambia evaluations (Lohmann et al., 2018; Shen et al., 2017).



Gaming, Verification Burden, and Data Integrity

A recurring and analytically important theme concerned the integrity of the very performance data on which PBF payment depends. Several respondents, speaking under assurance of confidentiality, described practices ranging from optimistic rounding of borderline indicator counts to more deliberate register manipulation, a pattern directly consistent with documented findings that providers across multiple Burkina Faso facilities "deliberately manipulated medical registers and documents, such that the reported quantity and quality of care differed from what was actually delivered" [13]. Community-based verification, intended as a safeguard against exactly this behavior, generated its own unintended consequences in our data: verification visits were described as time-consuming, occasionally productive of household-level friction when investigators contacted patients' families to confirm reported services, and in some instances the verification process itself was described as subject to informal negotiation between facility staff and verifiers — closely echoing prior documentation of falsification risk and household tension arising from community verification exercises in Burkina Faso [12].

Facility managers and district verification officers, for their part, described verification burden as a source of workload strain that a broader rapid review has classified among the recognized categories of unintended consequences of incentive schemes in healthcare, alongside measurement narrowing, effort substitution, and inequitable distributional effects [19]. Notably, our data suggest that gaming behavior was not evenly distributed: it clustered at facilities where workers also reported the weakest sense of procedural fairness in bonus calculation, suggesting that data integrity risk may function less as an independent design flaw and more as a downstream symptom of motivational and relational strain elsewhere in the scheme.

Study facility mechanisms compared against the broader multi-country performance-based financing evidence base.

Country/setting	PBF design feature examined	Reported motivational or integrity finding	Key reference
Rwanda	Facility and community PBF combined	Productivity and patient-satisfaction gains; extended effects to home visits	Shapira et al. 2018; Lannes 2015
Malawi	Facility PBF with SDT-based motivation measurement	No net change in overall intrinsic motivation; mixed need-satisfaction effects	Lohmann et al. 2018
Zambia	Donor-funded facility PBF	Perceived bonus value improved morale; equity concerns over distribution	Shen et al. 2017; Bergman et al. 2021
Burkina Faso	Facility PBF with community verification and equity add-ons	Register manipulation, verification friction, inequitable utilization gains	Turcotte-Tremblay et al. 2017; 2018; 2022; Fillol et al. 2019
Democratic Republic of Congo	Donor-funded facility PBF, later withdrawn	Motivation fell below pre-PBF baseline after withdrawal	Maini et al. 2019; Fox et al. 2013

This interpretation is consistent with the broader typology of pay-for-performance scheme designs, which finds that safeguards against gaming are among the least consistently reported and least standardized design elements across P4P schemes globally, despite gaming risk being widely acknowledged as a central design concern [1]. In our sample, facilities that had experienced a formal data-quality audit finding in the previous cycle showed, if anything, a modest subsequent increase in reported procedural anxiety among staff rather than a straightforward correction of prior misreporting, suggesting that punitive audit responses alone may not resolve the underlying motivational drivers of gaming behavior identified here.

Fragility of Motivational Gains Under Funding Uncertainty

A final theme concerned the durability of any motivational gains PBF had produced. Workers in facilities that had experienced funding interruptions, delayed disbursements, or explicit warnings of donor transition described acute anxiety about an eventual PBF withdrawal, a concern directly substantiated by DRC evidence that health workers whose PBF had recently been withdrawn scored significantly lower on multiple motivation dimensions than workers who had never received PBF at all [16]. This finding, replicated qualitatively in our sample through accounts of workers describing salary as insufficient recognition relative to a discontinued bonus, aligns with earlier DRC evidence that government salaries were valued by workers as institutional recognition even where donor-funded PBF allowances were comparatively larger, but were nonetheless perceived as more reliable and dignifying than transient donor incentives [17]. Table 2 summarizes the principal motivational mechanisms identified across the qualitative dataset alongside their quantitative

counterparts, and Table 1 situates these mechanisms against the broader multi-country evidence base reviewed above. Figure 2 presents the distribution of self-reported drivers of PBF-related motivational change identified through the qualitative coding process.

Principal motivational mechanisms identified through qualitative and quantitative analysis, by theme.

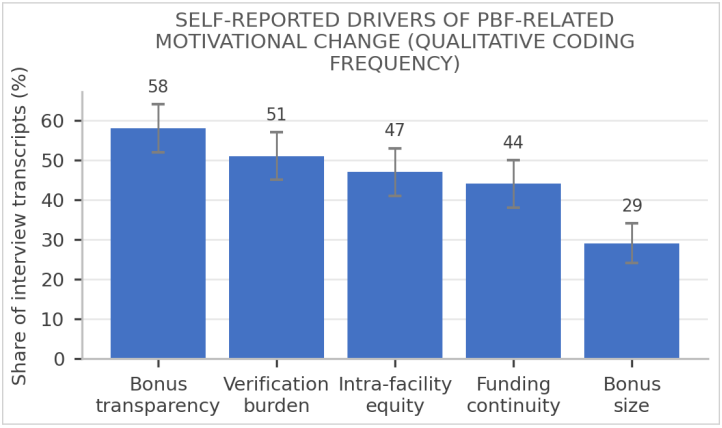
Theme	Mechanism observed	Direction of motivational effect	Key supporting reference
Bonus transparency and predictability	Autonomy-supportive framing of feedback on incentivized indicators	Sustains or enhances intrinsic motivation	Ryan & Deci 2000; Lohmann et al. 2018
Intra-facility bonus distribution	Perceived unfairness across incentivized versus non-incentivized cadres	Erodes motivation and teamwork	Schuster et al. 2018
Equity add-on measures	Added verification burden without proportionate reward	Neutral to negative on perceived fairness	Mwase et al. 2022; Turcotte-Tremblay et al. 2018
Community verification	Register manipulation and household-level friction	Undermines trust and data integrity	Turcotte-Tremblay et al. 2017; 2022
Funding continuity	Anticipated or realized PBF withdrawal	Sharp motivational decline below pre-PBF baseline	Maini et al. 2019; Fox et al. 2013

Discussion

Three broader conclusions follow from these findings. First, the evidence does not support a single directional claim — either that PBF reliably crowds out intrinsic motivation or that it reliably enhances it. Instead, consistent with motivation crowding theory and SDT, the direction and magnitude of PBF's motivational effect appears conditional on whether the scheme's administrative architecture is experienced by health workers as autonomy-supportive (transparent criteria, predictable disbursement, participatory indicator-setting) or controlling (opaque calculation, arbitrary adjustment, narrow surveillance-style verification) [7,8,14]. This reframes the design question facing policymakers away from "does PBF work" toward "which implementation features of a given PBF scheme determine whether its incentive structure sustains or undermines the workforce motivation it depends on."

Second, equity considerations cut in two directions simultaneously. PBF's differential rewarding of incentivized versus non-incentivized tasks and cadres generates intra-facility equity tensions that existing evaluation designs, focused on facility- or patient-level outcomes, are poorly positioned to detect [20]. At the same time, efforts to layer explicit equity measures onto PBF to protect the poorest patients have not reliably achieved that protective effect and may add uncompensated burden perceived as unfair by frontline staff [21,22]. This suggests that equity-oriented PBF design requires attention to health worker-facing fairness, not only patient-facing targeting, if it is to avoid generating new forms of resentment that could ultimately undermine the very service quality the equity measure was meant to protect.

Self-reported drivers of PBF-related motivational change identified through qualitative thematic coding across study facilities, illustrating that procedural fairness and verification burden were cited more frequently than bonus size itself.



Third, the gaming and verification findings indicate that data integrity in PBF should be understood as an outcome of the motivational climate the scheme creates, rather than solely as a technical measurement-design problem to be solved through more intensive independent verification. Community verification systems, while conceptually a safeguard, generated their own workload and relational costs that in some cases appeared to erode rather than restore trust [12]. Rapid-review evidence classifying gaming as one of several recognized unintended consequences of performance incentive schemes supports treating it as a predictable systemic risk requiring proactive design mitigation — reasonable indicator scope, feasible verification burden, and perceived fairness — rather than as an occasional integrity lapse to be addressed only after detection [19].

These findings also carry implications for how PBF evaluations are designed and funded. Evaluation frameworks that measure only facility- or district-level service utilization will systematically miss the intra-facility equity tensions, verification-related relational costs, and motivational fragility around funding transitions documented here, because these mechanisms operate below the level of aggregation at which utilization data are typically collected and reported [20,16]. We therefore argue that mixed-methods designs of the kind used in this study, or the joint quantitative-qualitative approaches previously applied in Malawi and Tanzania, should be considered a standard rather than an optional component of PBF evaluation protocols specifically because motivation operates through mechanisms that neither administrative data nor single-method survey instruments can adequately triangulate on their own [14,3].

This study has several limitations. The purposive facility sampling strategy, while appropriate for a mixed-methods case study aiming at explanatory depth, limits the generalizability of the quantitative findings, and the largely cross-sectional design constrains causal inference regarding motivation trajectories over time; longitudinal designs of the kind used in the Afghanistan system-dynamics evaluation would strengthen causal attribution in future work [4]. Self-reported motivation and gaming behavior are also subject to social desirability bias, particularly for the latter, although the convergence of self-reported gaming accounts with independently documented register-manipulation findings from comparable settings lends some confidence to the qualitative findings [13]. Finally, because PBF schemes vary

substantially in design — indicator selection, bonus size, verification modality, and equity add-ons — findings from this case study should be interpreted as illustrative of mechanisms rather than as a universal empirical estimate of PBF's motivational effect, consistent with the broader typology literature documenting this design heterogeneity [1].

Conclusion

Performance-based financing does not have a single, fixed effect on health worker motivation in public health facilities; rather, it activates a set of psychological and organizational mechanisms — perceived autonomy and fairness of the incentive process, intra-facility equity, and the integrity pressures created by verification — whose net direction depends on how the scheme is designed and implemented rather than on the presence of financial incentives per se. Policymakers seeking to strengthen rather than erode health worker motivation through PBF should prioritize transparent and predictable bonus calculation, mechanisms to share incentive benefits equitably across incentivized and non-incentivized cadres, verification approaches proportionate to genuine integrity risk rather than uniformly maximal scrutiny, and contingency planning for the motivational shock that donor-funded PBF withdrawal can produce. Future mixed-methods research that follows facilities longitudinally through PBF introduction, adaptation, and eventual transition or withdrawal would help clarify which of these design features most reliably protect the workforce motivation on which any performance-based financing scheme ultimately depends.

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